

### 1.1.1 IFD IF Digitizer



The IFD 14-bit IF digitizer is a totally sealed unit for optimum low-noise performance. The use of digital components within the IFD is minimized and the unit is carefully grounded and shielded to make the cleanest possible digital capture of the input IF signal. Because of this, the IFD achieves the theoretical minimum noise level for the A/D convertors.

There are 4 inputs to the IFD:

- IF video signal.
- A secondary IF video signal, used for dual polarization or very wide dynamic range applications.
- IF Burst Pulse for magnetron or IF COHO for Klystron.
- Optional reference clock for system synchronization. For a Klystron system, the COHO can be input. Magnetron systems do not require this signal. This clock can even come from the RVP8/Tx card itself.

All of these inputs are on SMA connectors. The IF signal input is made immediately after the STALO mixing/sideband filtering step of the receiver where a traditional log receiver would normally be installed. The required signal level for both the IF signal and burst is +6.5 dBm for the strongest expected input signal. A fixed attenuator or IF amplifier may be used to adjust the signal level to be in this range.

Digitizing is performed for both the IF signal and burst/COHO channels at approximately 72 MHz to 14-bits. This provides 92 to 105 dB of dynamic range (depending on pulse width) without using complex AGC, dual A/D ranging or down mixing to a lower IF frequency.

All communication to the main RVP8 chassis goes over a special CAT5E type cable. The major volume of data is the raw time series samples sent down to the RVP8 Rx card. Coming back up is trigger timing and AFC information to the IFD.

The RVP8 provides comprehensive AFC support for tuning the STALO of a magnetron system. Alternatively, the magnetron itself can be tuned by a motorized tuning circuit controlled by the RVP8. Both analog (+10V) and digital tuning (with optional DAFC to 24 bits) are supported.